Name: Date:

Polynomial Factoring solution (version 653)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 42 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(42)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 168}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-24}}{2}$$

$$x = \frac{12 \pm \sqrt{-4 \cdot 6}}{2}$$

$$x = \frac{12 \pm 2\sqrt{6}\, i}{2}$$

$$x = 6 \pm \sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 - 5i$ and $-2 - 9i$ in standard form $(a + bi)$.**

Solution

$$(7 - 5i) \cdot (-2 - 9i)$$

$$-14 - 63i + 10i + 45i^2$$

$$-14 - 63i + 10i - 45$$

$$-14 - 45 - 63i + 10i$$

$$-59 - 53i$$

Polynomial Factoring solution (version 653)

3. **Write function $f(x) = x^3 + 12x^2 + 47x + 60$ in factored form. I'll give you a hint: one factor is $(x + 3)$.**

Solution

	1	12	47	60
-3		-3	-27	-60
	1	9	20	0

$$f(x) = (x+3)(x^2+9x+20)$$

$$f(x) = (x+3)(x+4)(x+5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+4)^2 \cdot (x-1) \cdot (x-5) \cdot (x-8)$$

Sketch a graph of polynomial $y = p(x)$.